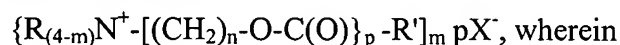


What is claimed is:

1. A method of inhibiting metal corrosion during a subterranean treatment operation comprising using an acidic treatment fluid comprising an acidic fluid and at least one esterquat.

2. The method of claim 1 wherein the esterquat is present in the acidic treatment fluid in an amount of about 5% or below based on the total volume of the acidic fluid.

3. The method of claim 1 wherein the esterquat comprises a normal esterquat having the general formula:



R represents a linear or branched chain saturated or unsaturated aliphatic hydrocarbon, aryl, arylalkyl, alkyl amide, hydroxy alkyl, or a mixture thereof, wherein, when there is more than one R group, they may be the same as one another or each may be different from one another;

m is an integer in the range from 1 to 3;

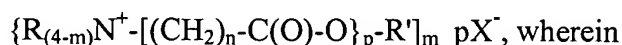
p is an integer of at least 1;

R' represents a linear or branched chain saturated or unsaturated aliphatic hydrocarbon, aryl, arylalkyl, alkyl amide, or a mixture thereof;

n is an integer in the range from 1 to 6; and

X<sup>-</sup> represents an anionic counter ion, examples of which include, but are not limited to, a halide, sulfate, methosulfate, or methophosphate.

4. The method of claim 1 wherein the esterquat comprises a reverse esterquat having the general formula:



R represents a linear or branched chain saturated or unsaturated aliphatic hydrocarbon, aryl, arylalkyl, alkyl amide, hydroxy alkyl, or a mixture thereof, wherein, when there is more than one R group, they may be the same as one another or each may be different from one another;

m is an integer in the range from 1 to 3;

p is an integer of at least 1;

R' represents a linear or branched chain saturated or unsaturated aliphatic hydrocarbon, aryl, arylalkyl, alkyl amide, or a mixture thereof;

n is an integer in the range from 1 to 6; and

X<sup>-</sup> represents an anionic counter ion, examples of which include, but are not limited to, a halide, sulfate, methosulfate, or methophosphate.

5. The method of claim 3 wherein R further comprises a substituent group comprising an aryl group, an alkoxy group, a hydroxyl group, an aryloxy group, an amido group, or a combination thereof.

6. The method of claim 4 wherein R further comprises a substituent group comprising an aryl group, an alkoxy group, a hydroxyl group, an aryloxy group, an amido group, or a combination thereof.

7. The method of claim 3 wherein R' further comprises a substituent group comprising a hydroxyl group, a carbonyl group, an amido group, an aryl group, a sulfur, or a combination thereof.

8. The method of claim 4 wherein R' further comprises a substituent group comprising a hydroxyl group, a carbonyl group, an amido group, an aryl group, a sulfur, or a combination thereof.

9. The method of claim 1 wherein the acidic fluid exhibits a pH of less than about 6.

10. The method of claim 1 wherein the acidic fluid exhibits a pH of less than about 4.

11. The method of claim 1 wherein the acidic fluid comprises hydrochloric acid, hydrofluoric acid, acetic acid, formic acid, hydroxyfluoboric acid, citric acid, EDTA, or a combination thereof.

12. The method of claim 1 wherein the acidic treatment fluid further comprises a surfactant.

13. The method of claim 12 wherein the acidic treatment fluid comprises a surfactant in an amount from about 1% of the volume of the esterquat to about 100% of the volume of the esterquat.

14. The method of claim 12 wherein the surfactant is a non-ionic surfactant comprising an alkyoxylate, an alkylphenol, an ethoxylated alkyl amine, an ethoxylated oleate, a tall oil, an ethoxylated fatty acid, or a combination thereof.

15. The method of claim 12 wherein the surfactant is a cationic surfactant comprising an alkylamine oxide, an alkylammonium salt, or a combination thereof.

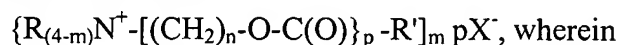
16. The method of claim 12 wherein the surfactant is an anionic surfactant comprising an  $\alpha$ -sulfonated ester, an alkylbenzenesulfonate, or a combination thereof.

17. The method of claim 1 wherein the acidic treatment fluid further comprises a solvent.
18. The method of claim 17 wherein the acidic treatment fluid comprises a solvent in an amount from about 1% of the volume of the esterquat to about 100% of the volume of the esterquat.
19. The method of claim 17 wherein the solvent comprises water, an alcohol, a glycol, a glycol ether, or a combination thereof.
20. The method of claim 1 wherein the acidic treatment fluid further comprises a traditional corrosion inhibitor.
21. The method of claim 20 wherein the traditional corrosion inhibitor comprises cinnamaldehyde, an acetylenic alcohol, a fluorinated surfactant, a quaternary derivative of a heterocyclic nitrogen base, a condensation product of a carbonyl-containing compound, a nitrogen-containing compound and an aldehyde, a formamide, a surface active agent, a solvent, or a combination thereof.
22. The method of claim 20 further comprising iodine.
23. The method of claim 1 wherein the esterquat included in the acidic treatment fluid has a physical form comprising a liquid, a solution, a solid, or a combination thereof.

24. A method of reducing sludge formation during a subterranean treatment operation formation comprising the step of using an acidic treatment fluid comprising an acidic fluid and at least one esterquat.

25. The method of claim 24 wherein the esterquat is present in the acidic treatment fluid in an amount of about 5% or below based on the total volume of the acidic fluid.

26. The method of claim 24 wherein the esterquat comprises a normal esterquat having the general formula:



R represents a linear or branched chain saturated or unsaturated aliphatic hydrocarbon, aryl, arylalkyl, alkyl amide, hydroxy alkyl, or a mixture thereof, wherein, when there is more than one R group, they may be the same as one another or each may be different from one another;

m is an integer in the range from 1 to 3;

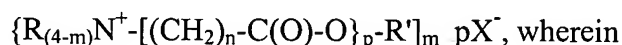
p is an integer of at least 1;

R' represents a linear or branched chain saturated or unsaturated aliphatic hydrocarbon, aryl, arylalkyl, alkyl amide, or a mixture thereof;

n is an integer in the range from 1 to 6; and

X<sup>-</sup> represents an anionic counter ion, examples of which include, but are not limited to, a halide, sulfate, methosulfate, or methophosphate.

27. The method of claim 24 wherein the esterquat comprises a reverse esterquat having the general formula:



R represents a linear or branched chain saturated or unsaturated aliphatic hydrocarbon, aryl, arylalkyl, alkyl amide, hydroxy alkyl, or a mixture thereof, wherein, when there is more than one R group, they may be the same as one another or each may be different from one another;

m is an integer in the range from 1 to 3;

p is an integer of at least 1;

R' represents a linear or branched chain saturated or unsaturated aliphatic hydrocarbon, aryl, arylalkyl, alkyl amide, or a mixture thereof;

n is an integer in the range from 1 to 6; and

X<sup>-</sup> represents an anionic counter ion, examples of which include, but are not limited to, a halide, sulfate, methosulfate, or methophosphate.

28. The method of claim 26 wherein R further comprises a substituent group comprising an aryl group, an alkoxy group, a hydroxyl group, an aryloxy group, an amido group, or a combination thereof.

29. The method of claim 27 wherein R further comprises a substituent group comprising an aryl group, an alkoxy group, a hydroxyl group, an aryloxy group, an amido group, or a combination thereof.

30. The method of claim 26 wherein R' further comprises a substituent group comprising a hydroxyl group, a carbonyl group, an amido group, an aryl group, a sulfur, or a combination thereof.

31. The method of claim 27 wherein R' further comprises a substituent group comprising a hydroxyl group, a carbonyl group, an amido group, an aryl group, a sulfur, or a combination thereof.

32. The method of claim 24 wherein the acidic fluid exhibits a pH of less than about 6.

33. The method of claim 24 wherein the acidic fluid exhibits a pH of less than about 4.

34. The method of claim 24 wherein the acidic fluid comprises hydrochloric acid, hydrofluoric acid, acetic acid, formic acid, hydroxyfluoboric acid, citric acid, EDTA, or a combination thereof.

35. The method of claim 24 wherein the acidic treatment fluid further comprises a surfactant.

36. The method of claim 35 wherein the acidic treatment fluid comprises a surfactant in an amount from about 1% of the volume of the esterquat to about 100% of the volume of the esterquat.

37. The method of claim 35 wherein the surfactant is a non-ionic surfactant comprising an alkyoxylate, an alkylphenol, an ethoxylated alkyl amine, an ethoxylated oleate, a tall oil, an ethoxylated fatty acid, or a combination thereof.

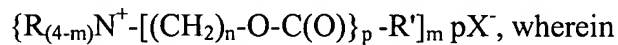
38. The method of claim 35 wherein the surfactant is a cationic surfactant comprising an alkylamine oxide, an alkylammonium salt, or a combination thereof.

39. The method of claim 35 wherein the surfactant is an anionic surfactant comprising an  $\alpha$ -sulfonated ester, an alkylbenzenesulfonate, or a combination thereof.
40. The method of claim 24 wherein the acidic treatment fluid further comprises a solvent.
41. The method of claim 40 wherein the acidic treatment fluid comprises a solvent in an amount from about 1% of the volume of the esterquat to about 100% of the volume of the esterquat.
42. The method of claim 40 wherein the solvent comprises water, an alcohol, a glycol, a glycol ether, or a combination thereof.
43. The method of claim 24 wherein the acidic treatment fluid further comprises an aromatic hydrocarbon compound that exhibits high oil-wetting characteristics.
44. The method of claim 43 wherein the hydrocarbon compound that exhibits high oil-wetting characteristics comprises a xylene, a saturated biphenyl-xylene admixture, a heavy aromatic naphtha, a heavy aromatic solvent, a tetralene, a tetrahydroquinoline, a tetrahydronaphthalene, or a combination thereof.
45. The method of claim 43 wherein the acidic treatment fluid comprises an aromatic hydrocarbon compound that exhibits high oil-wetting characteristics in an amount from about 1% of the volume of the esterquat to about 200%.
46. The method of claim 24 wherein the esterquat included in the acidic treatment fluid has a physical form comprising a liquid, a solution, a solid, or a combination thereof.

47. A method of inhibiting the formation of emulsions during a subterranean treatment operation comprising using an acidic treatment fluid comprising an acidic fluid and at least one esterquat.

48. The method of claim 47 wherein the esterquat is present in the acidic treatment fluid in an amount of about 5% or below based on the total volume of the acidic fluid.

49. The method of claim 47 wherein the esterquat comprises a normal esterquat having the general formula:



R represents a linear or branched chain saturated or unsaturated aliphatic hydrocarbon, aryl, arylalkyl, alkyl amide, hydroxy alkyl, or a mixture thereof, wherein (when there is more than one R group) they may be the same as one another or each may be different from one another;

m is an integer in the range from 1 to 3;

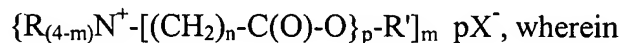
p is an integer of at least 1;

R' represents a linear or branched chain saturated or unsaturated aliphatic hydrocarbon, aryl, arylalkyl, alkyl amide, or a mixture thereof;

n is an integer in the range from 1 to 6; and

X<sup>-</sup> represents an anionic counter ion, examples of which include, but are not limited to, a halide, sulfate, methosulfate, or methophosphate.

50. The method of claim 47 wherein the esterquat comprises a reverse esterquat having the general formula:



R represents a linear or branched chain saturated or unsaturated aliphatic hydrocarbon, aryl, arylalkyl, alkyl amide, hydroxy alkyl, or a mixture thereof, wherein (when there is more than one R group) they may be the same as one another or each may be different from one another;

m is an integer in the range from 1 to 3;

p is an integer of at least 1;

R' represents a linear or branched chain saturated or unsaturated aliphatic hydrocarbon, aryl, arylalkyl, alkyl amide, or a mixture thereof;

n is an integer in the range from 1 to 6; and

X<sup>-</sup> represents an anionic counter ion, examples of which include, but are not limited to, a halide, sulfate, methosulfate, or methophosphate.

51. The method of claim 49 wherein R further comprises a substituent group comprising an aryl group, an alkoxy group, a hydroxyl group, an aryloxy group, an amido group, or a combination thereof.

52. The method of claim 50 wherein R further comprises a substituent group comprising an aryl group, an alkoxy group, a hydroxyl group, an aryloxy group, an amido group, or a combination thereof.

53. The method of claim 49 wherein R' further comprises a substituent group comprising a hydroxyl group, a carbonyl group, an amido group, an aryl group, a sulfur, or a combination thereof.

54. The method of claim 47 wherein R' further comprises a substituent group comprising a hydroxyl group, a carbonyl group, an amido group, an aryl group, a sulfur, or a combination thereof.

55. The method of claim 47 wherein the acidic fluid exhibits a pH of less than about 6.

56. The method of claim 47 wherein the acidic fluid exhibits a pH of less than about 4.

57. The method of claim 47 wherein the acidic fluid comprises hydrochloric acid, hydrofluoric acid, acetic acid, formic acid, hydroxyfluoboric acid, citric acid, EDTA, or a combination thereof.

58. The method of claim 47 wherein the acidic treatment fluid further comprises a surfactant.

59. The method of claim 58 wherein the acidic treatment fluid comprises a surfactant in an amount from about 1% of the volume of the esterquat to about 100% of the volume of the esterquat.

60. The method of claim 58 wherein the surfactant is a non-ionic surfactant comprising an alkyoxylate, an alkylphenol, an ethoxylated alkyl amine, an ethoxylated oleate, a tall oil, an ethoxylated fatty acid, or a combination thereof.

61. The method of claim 58 wherein the surfactant is a cationic surfactant comprising an alkylamine oxide, an alkylammonium salt, or a combination thereof.



62. The method of claim 58 wherein the surfactant is an anionic surfactant comprising an  $\alpha$ -sulfonated ester, an alkylbenzenesulfonate, or a combination thereof.

63. The method of claim 47 wherein the acidic treatment fluid further comprises a solvent.

64. The method of claim 63 wherein the acidic treatment fluid comprises a solvent in an amount from about 1% of the volume of the esterquat to about 100% of the volume of the esterquat.

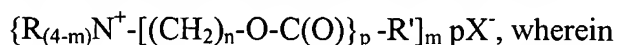
65. The method of claim 63 wherein the solvent comprises water, an alcohol, a glycol, a glycol ether, or a combination thereof.

66. The method of claim 47 wherein the esterquat included in the acidic treatment fluid has a physical form comprising a liquid, a solution, a solid, or a combination thereof.

67. An acidic subterranean treatment fluid comprising an acidic fluid and an esterquat.

68. The acidic subterranean treatment fluid of claim 67 wherein the esterquat is present in the acidic treatment fluid in an amount of about 5% or below based on the total volume of the acidic fluid.

69. The acidic subterranean treatment fluid of claim 67 wherein the esterquat comprises a normal esterquat having the general formula:



R represents a linear or branched chain saturated or unsaturated aliphatic hydrocarbon, aryl, arylalkyl, alkyl amide, hydroxy alkyl, or a mixture thereof, wherein (when there is more than one R group) they may be the same as one another or each may be different from one another;

m is an integer in the range from 1 to 3;

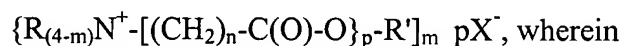
p is an integer of at least 1;

R' represents a linear or branched chain saturated or unsaturated aliphatic hydrocarbon, aryl, arylalkyl, alkyl amide, or a mixture thereof;

n is an integer in the range from 1 to 6; and

X<sup>-</sup> represents an anionic counter ion, examples of which include, but are not limited to, a halide, sulfate, methosulfate, or methophosphate.

70. The acidic subterranean treatment fluid of claim 67 wherein the esterquat comprises a reverse esterquat having the general formula:



R represents a linear or branched chain saturated or unsaturated aliphatic hydrocarbon, aryl, arylalkyl, alkyl amide, hydroxy alkyl, or a mixture thereof, wherein (when there is more than one R group) they may be the same as one another or each may be different from one another;

m is an integer in the range from 1 to 3;

p is an integer of at least 1;

R' represents a linear or branched chain saturated or unsaturated aliphatic hydrocarbon, aryl, arylalkyl, alkyl amide, or a mixture thereof;

n is an integer in the range from 1 to 6; and

X<sup>-</sup> represents an anionic counter ion, examples of which include, but are not limited to, a halide, sulfate, methosulfate, or methophosphate.

71. The acidic subterranean treatment fluid of claim 69 wherein R further comprises a substituent group comprising an aryl group, an alkoxy group, a hydroxyl group, an aryloxy group, an amido group, or a combination thereof.

72. The acidic subterranean treatment fluid of claim 70 wherein R further comprises a substituent group comprising an aryl group, an alkoxy group, a hydroxyl group, an aryloxy group, an amido group, or a combination thereof.

73. The acidic subterranean treatment fluid of claim 69 wherein R' further comprises a substituent group comprising a hydroxyl group, a carbonyl group, an amido group, an aryl group, a sulfur, or a combination thereof.

74. The acidic subterranean treatment fluid of claim 70 wherein R' further comprises a substituent group comprising a hydroxyl group, a carbonyl group, an amido group, an aryl group, a sulfur, or a combination thereof.

75. The acidic subterranean treatment fluid of claim 67 wherein the acidic fluid exhibits a pH of less than about 6.

76. The acidic subterranean treatment fluid of claim 67 wherein the acidic fluid exhibits a pH of less than about 4.

77. The acidic subterranean treatment fluid of claim 67 wherein the acidic fluid comprises hydrochloric acid, hydrofluoric acid, acetic acid, formic acid, hydroxyfluoboric acid, citric acid, EDTA, or a combination thereof.

78. The acidic subterranean treatment fluid of claim 67 wherein the acidic treatment fluid further comprises a surfactant.

79. The acidic subterranean treatment fluid of claim 78 wherein the acidic treatment fluid comprises a surfactant in an amount from about 1% of the volume of the esterquat to about 100% of the volume of the esterquat.

80. The acidic subterranean treatment fluid of claim 78 wherein the surfactant is a non-ionic surfactant comprising an alkyoxylate, an alkylphenol, an ethoxylated alkyl amine, an ethoxylated oleate, a tall oil, an ethoxylated fatty acid, or a combination thereof.

81. The acidic subterranean treatment fluid of claim 78 wherein the surfactant is a cationic surfactant comprising an alkylamine oxide, an alkylammonium salt, or a combination thereof.
82. The acidic subterranean treatment fluid of claim 78 wherein the surfactant is an anionic surfactant comprising an  $\alpha$ -sulfonated ester, an alkylbenzenesulfonate, or a combination thereof.
83. The acidic subterranean treatment fluid of claim 67 wherein the acidic treatment fluid further comprises a solvent.
84. The acidic subterranean treatment fluid of claim 83 wherein the acidic treatment fluid comprises a solvent in an amount from about 1% of the volume of the esterquat to about 100% of the volume of the esterquat.
85. The acidic subterranean treatment fluid of claim 83 wherein the solvent comprises water, an alcohol, a glycol, a glycol ether, or a combination thereof.
86. The acidic subterranean treatment fluid of claim 67 wherein the esterquat included in the acidic treatment fluid has a physical form comprising a liquid, a solution, a solid, or a combination thereof.